Documentation for C libraries

Steven Andrews, © July 2003

These libraries have been written to be fast and simple. They are not particularly friendly, in that they may crash catastrophically when given illegal inputs. They also don't produce elegant user friendly software. However, when used properly, they should be quite robust, moderately fast, and easy to use. As this is a work in progress, the libraries are sometimes changed in minor ways, which can cause problems with older programs.

Most routines documented here were written on a Macintosh with either Think C or Metrowerks CodeWarrior C, while a couple were written on a PC running Linux and compiled with gcc. I have attempted to conform to ANSII standards as closely as possible. With a couple exceptions, noted below, the libraries should be platform independent. However, most have only been used on a Macintosh or on a PC running Linux, so it is possible that there are incompatabilities with other systems. Most input and output is carried out through the standard i/o port. All memory management is carried out with the `malloc()` and `calloc()` standard library functions. Random numbers are generated with the standard library `rand()` function.

These routines were all written by myself. However, significant fractions of a few routines were copied nearly verbatim from *Numerical Recipes in C*, which is noted where appropriate. A few other books have proved especially helpful as well and are listed below. The libraries documented here are available to and may be modified by anyone for non-commercial use, but their use should be acknowledged as appropriate. Except for portions that have been copyrighted previously, the source code, the documentation, and the compiled programs called *SpectFit* and *Smoldyn* are copyrighted by myself. No warrenty is made regarding the performance, suitability, or accuracy of any portion of code or documentation.

References

Kernighan, Brian W. and Dennis M. Ritchie. *The C Programming Language, Second Edition*. Prentice Hall. Englewood Cliffs, New Jersey. 1988.

Press, William H., Brian P. Flannery, Saul A. Teukolsky, and William T. Vetterling. *Numerical Recipies in C: The Art of Scientific Computing*. Cambridge University Press. Cambridge. 1988.

Stuart, A.M. and A.R. Humphries. *Dynamical Systems and Numerical Analysis*. Cambridge University Press. Cambridge. 1996.

Wright, Richard S. Jr. and Michael Sweet. *OpenGL SuperBible, Second Edition*. Waite Group Press. Indianapolis, Indiana. 2000.

Library Dependencies

	Platform	BasisFn.h	BasisFns.h	Cn.h	Constants.h	DiskIO.h	dynsys.h	errors.h	gnuPipe.h	math2.h	Plot.h	Plot3D.h	Quantum.h	queue.h	random.h	Rn.h	RnLU.h	RnSort.h	Set.h	Spectra.h	string2.h	Utility.h	VoidComp.h	Zn.h
BasisFn.c†	m	x		*		x				x	x				x	x	x	x	x	x	x	x		
BasisFns.c	m	x	x	*		*				x	*				*	x	*	x	x	x	x	*		
Cn.c				x						x					*	x		x						
Constants.h					x																			
DiskIO.c						x															x			
dynsys.c	m					x	x			*	x				*	x					*	x		
errors.c								x																
gnuPipe.c	L								x															
math2.c										x														
Plot.c	M									*	x				x						x			
Plot3D.c	m									*	x	x			*	x					*			
Quantum.c	m			x	x	*	x			x	x	x	x		x	x		*		x	*	*		
queue.c														x										
random.c										x					x									
Rn.c										x					x	x								
RnLU.c										x					*	x	x							
RnSort.c										*					*	x		x						
Set.c																			x					
Spectra.c	m			x		x				x	x				*	x		x		x	x			
string2.c																					x			
Utility.c	M																					x		
VoidComp.c																							x	
Zn.c										x					x									x

M - uses Macintosh toolbox routines directly
m - uses Macintosh toolbox routines indirectly
L - requires Linux style output redirection
x - sub-library used directly
* - sub-library used indirectly
† - requires additional headers

Some dependencies may be out of date. Also, not all libraries are included here.